

**WHAT IS CLAIMED IS:**

1. A switching control method for controlling traffic flow of an Ethernet frame comprising the steps of:

receiving the Ethernet frame containing predetermined priority information

5 based on a service class from a source node;

buffering the received Ethernet frame in a data buffer classified by a class of service (CoS) corresponding to the priority information;

comparing a size of data currently buffered in the data buffer with a predetermined threshold value;

10 when the size of data currently buffered in the data buffer is equal to or larger than the threshold value, generating a PAUSE frame containing a value of the CoS; and

transmitting the PAUSE frame to the source node.

2. The switching control method as set forth in claim 1, wherein the

15 predetermined threshold value is necessary for determining a traffic congestion state.

3. The switching control method as set forth in claim 1, further comprising the steps of:

when a state of the data buffer is the traffic congestion state as a result of the  
20 comparison using the threshold value, determining whether or not a spare space remains in the data buffer; and

if a spare space remains in the data buffer as a result of the determination, storing the received Ethernet frame in the data buffer according to the priority information

4. The switching control method as set forth in claim 3, further comprising the step of:

if a spare space does not remain in the data buffer as a result of the determination, discarding the received Ethernet frame.

5 5. The switching control method as set forth in claim 1, further comprising the step of:

when the size of data currently buffered in the data buffer is equal to or larger than the threshold value, setting a predetermined state flag indicative of a traffic congestion state.

10 6. The switching control method as set forth in claim 1, wherein the PAUSE frame further includes information of a predetermined pause time for which traffic transmission of a corresponding CoS is stopped.

15 7. The switching control method as set forth in claim 1, wherein the source node receiving the PAUSE frame stops transmission of an Ethernet frame having a priority of a corresponding CoS for a predetermined time.

8. The switching control method as set forth in claim 1, wherein information of the CoS is included in the PAUSE frame and header information of the Ethernet frame.

20 9. The switching control method as set forth in claim 1, wherein a priority of the CoS associated with voice traffic is higher than that associated with data traffic.

10. A switching control method for controlling traffic flow of an Ethernet

frame which is received from at least one source node is transmitted to at least one destination node, comprising the steps of:

extracting a payload of an Ethernet frame to be transmitted to the destination node from a data buffer according to a corresponding CoS, the data buffer buffering

5 the payload of the Ethernet frame based on a service class;

comparing a size of data currently buffered in the data buffer with a predetermined threshold value;

when the size of data currently buffered in the data buffer is smaller than the threshold value, generating an UNPAUSE frame having a value of the CoS and

10 information indicating termination of a PAUSE state; and

transmitting the UNPAUSE frame to the source node.

11. The switching control method as set forth in claim 10, wherein the predetermined threshold value is necessary for determining a traffic congestion state.

15 12. The switching control method as set forth in claim 10, further comprising the step of:

allowing the source node receiving the UNPAUSE frame to terminate the PAUSE state of traffic belonging to a corresponding CoS.

13. The switching control method as set forth in claim 10, further comprising  
20 the step of:

when the UNPAUSE frame is transmitted, setting predetermined flag information indicative of a traffic congestion state as a value of a traffic normal state.

14. The switching control method as set forth in claim 10, wherein the information indicative of the termination of the PAUSE state is time information set as a zero pause time.

15. A switching control method for controlling traffic flow of an Ethernet  
5 frame which is received from at least one source node is transmitted to at least one destination node, comprising the steps of:

allowing a predetermined network unit controlling the traffic flow to start an internal timer and to determine whether the pause time has expired;

10 if the pause time has expired, comparing a size of data currently buffered in a data buffer based on a service class with a predetermined threshold value;

when the size of data currently buffered in the data buffer is equal to or larger than the threshold value, re-generating a PAUSE frame containing a value of the CoS and information of the pause time; and

transmitting the PAUSE frame to the source node.

15 16. The switching control method as set forth in claim 15, wherein the predetermined threshold value is necessary for determining a traffic congestion state.

17. The switching control method as set forth in claim 15, wherein the source node re-stops transmission of the Ethernet frame for a time included in the pause  
20 time information.

18. The switching control method as set forth in claim 15, further comprising the step of:

when the size of data currently buffered in the data buffer is smaller than the

threshold value, generating an UNPAUSE frame in which the pause time for a corresponding CoS is set as “0” and transmitting the UNPAUSE frame to the input port coupled to the source node.

19. The switching control method as set forth in claim 18, wherein the  
5 UNPAUSE frame is generated in the same data format as a data format of the PAUSE frame.

20. A switching apparatus for controlling traffic flow of an Ethernet frame comprising:

at least one input port for receiving the Ethernet frame from a source node;  
10 at least one output port for transmitting the Ethernet frame to a destination node;

a shared memory shared between the input and output ports, the shared memory comprising:

15 a plurality of data buffers based on service classes for classifying and storing Ethernet frames received through the at least one input port; and  
a plurality of registers for registering reference information to be used based on the service class; and

20 a switching main module for determining a traffic congestion states on the basis of the reference information, generating a PAUSE frame to stop traffic flow of a corresponding class of service (CoS) when at least one of the data buffers is in the traffic congestion state, and transmitting the PAUSE frame to the source node.

21. The switching apparatus as set forth in claim 20, wherein the switching main module comprises:

a switching logic for switching a transmission path of the Ethernet frame

between the source node and the destination node; and

a memory manager for classifying and storing the Ethernet frame received through the input port, generating the PAUSE frame, and transmitting the generated PAUSE frame to the source node.

5        22. The switching apparatus as set forth in claim 20, wherein the PAUSE frame contains information of a predetermined pause time for which traffic transmission of a corresponding CoS is stopped.

10      23. The switching apparatus as set forth in claim 20, wherein the switching main module further generates a UNPAUSE frame to resume traffic flow of a corresponding CoS when it is determined that the traffic congestion state in each of the data buffers is switched to a normal state on the basis of the reference information, and transmits the generated UNPAUSE frame to the input port coupled to the source node.

15      24. The switching apparatus as set forth in claim 20, wherein the switching main module further generates a UNPAUSE frame corresponding to the CoS when a pause time has expired and the size of data currently buffered in the data buffer is smaller than a threshold value.

20      25. The switching apparatus as set forth in claim 20, wherein the switching main module further re-generates a PAUSE frame corresponding to the CoS when a pause time has expired and the size of data currently buffered in the data buffer is equal or larger than a threshold value.

26. The switching apparatus as set forth in claim 20, wherein the registers

comprises:

first registers for registering physical size information of the data buffers;  
second registers for registering predetermined threshold values necessary for determining the traffic congestion states of the data buffers;

5 third registers for registering size information of data currently buffered in the data buffers; and

fourth registers for registering predetermined state flags indicative of the traffic congestion states,

wherein the information registered in the first to fourth registers is used as  
10 the reference information.

27. The switching apparatus as set forth in claim 20, wherein the reference information comprises:

buffer size information indicative of maximum physical storage capacities of the data buffers;

15 predetermined threshold information indicative of threshold storage capacities of the data buffers necessary for determining the traffic congestion states based on the service class;

current data amount information indicative of amounts of data currently buffered in the data buffers based on the service class; and

20 state flags for setting the traffic congestion states based on the service class.

28. The switching apparatus as set forth in claim 27, wherein the switching main module determines that one of the data buffers is in the traffic congestion state when an amount of data currently buffered in the data buffer based on a corresponding CoS is equal to or more than a threshold value.